MAESTRO 100 CDMA

QUICK START GUIDE & USER MANUAL REV. 0.1

WWW.MAESTRO-WIRELESS.COM
EMAIL: CONTACT@MAESTRO-WIRELESS.COM
TEL: 852 2869 0688
FAX: 852 2525 4701
ADDRESS: ROOM 3603-3609, 36/F, 118 CONNAUGHT ROAD WEST, SHEUNG WAN, HONG KONG

Revision history

Rev.	Date	Details	Originated by
0.1	26 January 2011	First release	Frank Tang

This manual is written without any warranty.

Maestro Wireless Solutions Ltd. reserves the right to modify or improve the product and its accessories which can also be withdrawn without prior notice.

Besides, our company stresses the fact that the performance of the product as well as accessories depends not only on the proper conditions of use, but also on the environment around the places of use.

Maestro Wireless Solutions Ltd. assumes no liability for damage incurred directly or indirectly from errors, omissions or discrepancies between the modem and the manual.

This software, solution or application is provided on an "as is" basis. No warranty whether expressed or implied is given by **Maestro Wireless Solutions Ltd.** in relation to this software, solution or application. User shall assume the entire risk of using or relying on this software, solution, application.

In no event will **Maestro Wireless Solutions Ltd.** be liable for any loss or damage including without limitation, indirect or consequential loss, damage, or any loss, damage whatsoever arising from loss of data or profit arising out of, or in connection with, the use of this software, application or solution. Every effort is made to keep the software, application or solution up and running smoothly. However, **Maestro Wireless Solutions Ltd.** takes no responsibility for, and will not be liable for, the software, application or solution being temporarily unavailable due to technical issues beyond our control.

The above terms and conditions are subject to change without prior notice. The present use of this software, application or solution implies the user approves and understands all the above terms and conditions.

Contents

1 Introduction **5**

2 Equipments Description **6**

2.1 Package . . . 6

2.2 Reference documents . . . 6

2.3 Interfaces . . . 6

2.3.1 Status indicator . . . 7

2.3.2 CDMA antenna connector . . . 8

2.3.3 GPS antenna connector . . . 8

2.3.4 15-Pin D-Sub Female connector (RS232) . . . 8

2.3.5 4-Pin connector (Power input/output) . . . 9

2.4 Optional accessories . . . 10

3 Installation **12**

3.1 Mounting the modem . . . 12

3.2 Connect the CDMA antenna (SMA type) . . . 12

3.3 Connect the modem to external device . . . 12

3.4 Connect the DC power supply . . . 13

4 Registration to the Network **14**

4.1 Carrier requirements . . . 14

4.2 First Time Activation . . . 14

4.3 Provisioning . . . 14

4.4 Ready to use . . . 14

5 Troubleshooting **15**

5.1 The modem's LED does not light . . . 15

5.2 The modem's LED lights but does not blink long time after power up . . . 15

5.3 The modem does not respond to the terminal program . . . 15

5.4 Debug, or further command using Smart Terminal as example . . . 16

5.5 Basic operations 17

6 Specifications **18**

Safety precautions

General precautions

- The modem generates radio frequency (RF) power. When using the modem care must be taken on safety issues related to RF interference as well as regulations of RF equipment.
- Do not use your phone in aircraft, hospitals, petrol stations or in places where using GSM products is prohibited.
- Be sure that the modem will not be interfering with nearby equipment. For example: pacemakers or medical equipment. The antenna of the modem should be away from computers, office equipment, home appliance, etc.
- An external antenna must be connected to the modem for proper operation. Only used approved antennas with the modem. Please contact authorized dealer on finding an approved antenna.
- Always keep the antenna with minimum safety distance of 26.6cm or more from human body. Do not put the antenna inside metallic box, containers, etc.

Using the modem in vehicle

- Check for any regulation or law authorizing the use of GSM in vehicle in your country before installing the modem
- Install the modem by qualified personnel. Consult your vehicle dealer for any possible interference of electronic parts by the modem.
- The modem should be connected to the vehicle's supply system by using a fuse-protected terminal in the vehicle's fuse box
- Be careful when the modem is powered by the vehicle's main battery. The battery may be drained after extended period.

Protecting your modem

To ensure error-free usage, please install and operate your modem with care. Do remember the following:

- Do not expose the modem to extreme conditions such as high humidity/rain, high temperatures, direct sunlight, caustic/harsh chemicals, dust, or water.
- Do not try to disassemble or modify the modem. There is no user serviceable part inside and the warranty would be void.
- Do not drop, hit or shake the modem. Do not use the modem under extreme vibrating condition.
- Do not pull the antenna or power supply cable. Please attach or detach by holding the connector.
- Connect the modem only according to the instruction manual. Failure to do it will void the warranty

Chapter 1

Introduction

Maestro 100 CDMA is a AT command-driven modem built-in a Sierra Wireless Q26 Elite CDMA engine. Three different versions of the modem are available:

- For SPRINT network.
- For VERIZON network.
- Generic version (Provisioning for Carrier Requirement).

The modem is based on CDMA 2000 / 1XRTT dual band technology. Depending on the service subscribed, Maestro 100 CDMA supports async data, circuit switch data and packet data. Data rates are up to 153Kbps.

Chapter 2

Equipments Description

2.1 Package

The M100evo package includes the following:

- M100evo modem x 1
- Power cord with fuse x 1

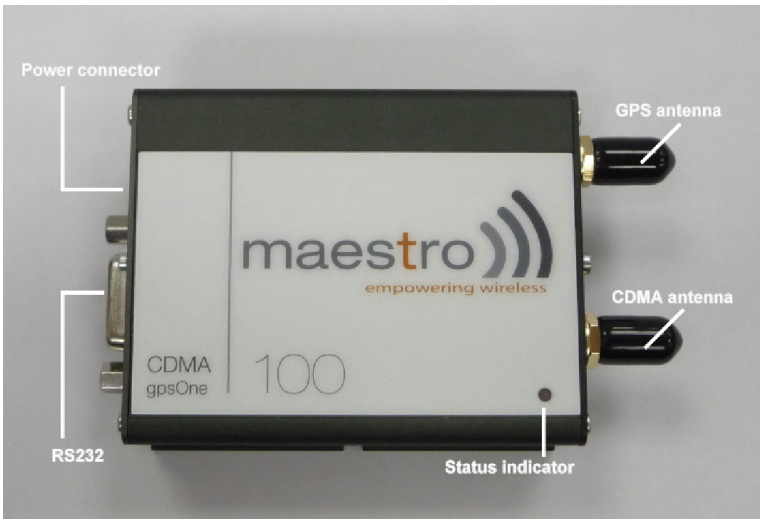
2.2 Reference documents

The M100 CDMA use a Sierra Wireless Q26 Elite module, so please refer to the Sierra Wireless User Manual and Applications Notes list below for further details, on:

- How to use the CDMA specific AT command: *AirPrime Q26 Elite Software User Guide and AT Commands Interface Specification.*
- Apps notes on CMUX features: *AirPrime CMUX Feature for Q26 Elite.*
- Apps notes on network registration details: *AirPrime Q26 Elite Activation on the Sprint Network* and *AirPrime Q26 Elite Activation on the Verizon Network.*

You can find those documents in the package given by Maestro Wireless Solution, or directly for the Sierra Wireless website: `http://www.sierrawireless.com/en/sitecore/content/Sierra%20Wireless/Support/Downloads/AirPrime/Q_Series/AirPrime_Q26_Elite.aspx`

2.3 Interfaces



2.3.1 Status indicator

The LED indicates different status of the modem:

- OFF: modem is switched off
- ON: modem is power-up
- Flashing slowly: modem is in idle mode
- Flashing rapidly: modem is in transmission/communication

2.3.2 CDMA antenna connector

Connect this to an external CDMA antenna with SMA male connector. Make sure the antenna is for the correct frequency with impedance of 50 Ohm, and also that the connector is tightly secured.

Characteristics	Cellular	PCS
Frequency	Tx 824-849	Tx 1850-1910
	Rx 869-894	Rx 1930-1990
Impedance (Ohm)	50	
VSWR	1.5:1 max	
Typical Radiated Gain	0 dbi	

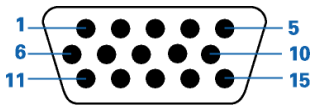
2.3.3 GPS antenna connector

Connect this to an Active GPS antenna with SMA male connector.

Characteristics of the GPS antenna	nominal value
Frequency (MHz)	1575
Impedance (Ohm)	50
VSWR	1.5:1 max
DC bias voltage (V)	5
Current consumption (mA)	40mA max

2.3.4 15-Pin D-Sub Female connector (RS232)

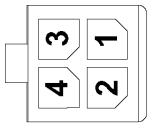
This connector provides serial link to the modem.



Pin Number	Name	EIA designation	Type	Note
1	DCD	Data Carrier Detect	Output	
2	TX	Transmit Data	Input	
3	NC	-	-	No Connection
4	NC	-	-	No Connection
5	NC	-	-	No Connection
6	RX	Receive Data	Output	
7	DSR	Data Set Ready	Output	
8	DTR	Data Terminal Ready	Input	
9	GND	Ground	Ground	
10	NC	-	-	No Connection
11	CTS	Clear To Send	Output	
12	RTS	Request To Send	Input	
13	RI	Ring Indicator	Output	
14	RESET		Input	Pull low to reset
15	NC	-	-	No Connection

2.3.5 4-Pin connector (Power input/output)

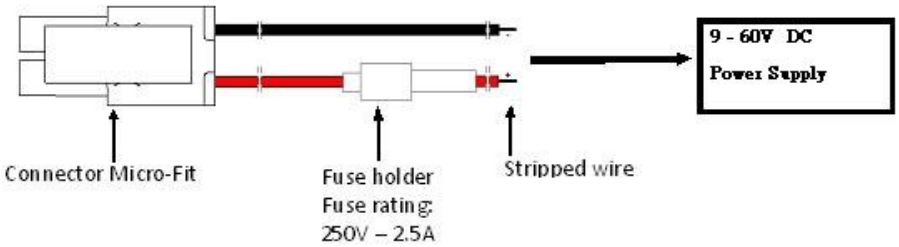
A cable, included in the package shall be used for power supply connection:



Pin assignment of 4-Pin connector:

Pin number	Name	Functions
1	-	No Connection
2	-	No Connection
3	POWER -	DC power negative input (or ground)
4	POWER +	DC power positive input

The power cable included in the package shall be used for power supply connection:



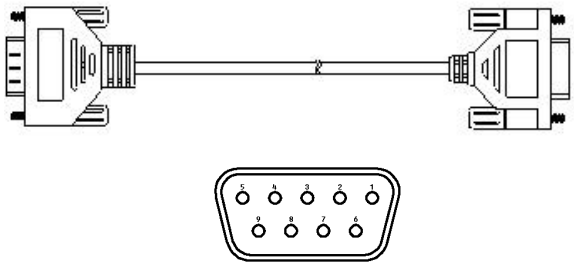
2.4 Optional accessories

You may contact your sales agent for the following optional accessories:

External antenna

- 800-1900MHz dual band
- SMA connector
- 0dBi

RS232 cable



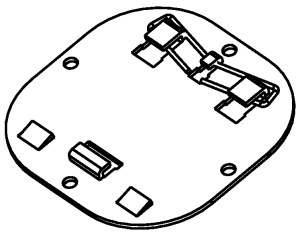
Sub-D 9 pin

- Direct connection with standard 9-pin RS-232 port (DTE)
- Shielded cable
- Cable length 1.1m (w/connector)

Pin assignment:

Sub-D 15 (male)	Sub-D 9 (female)
1	1
2	3
3	
4	
5	
6	2
7	6
8	4
9	5
10	
11	8
12	7
13	9
14	
15	

DIN rail mount



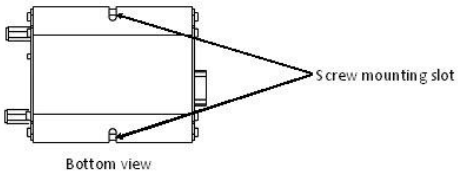
- Quick attachment / detachment to standard 35mm DIN rail
- Zinc plated steel

Chapter 3

Installation

3.1 Mounting the modem

Use 2 pieces of M3 screw to mount the modem on the DIN rail mount.mount if you are using it. Please refer to document "Installation of DIN rail mount" for details.



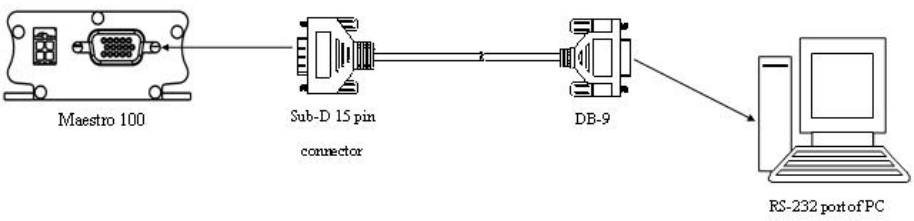
3.2 Connect the CDMA antenna (SMA type)

Connect this to CDMA antenna with SMA male connector. Make sure the antenna conforms to requirement stipulated in Section 2.3.2

3.3 Connect the modem to external device

You can use the optional RS232 cable to connect the modem's Sub-D connector to external controller/computer.

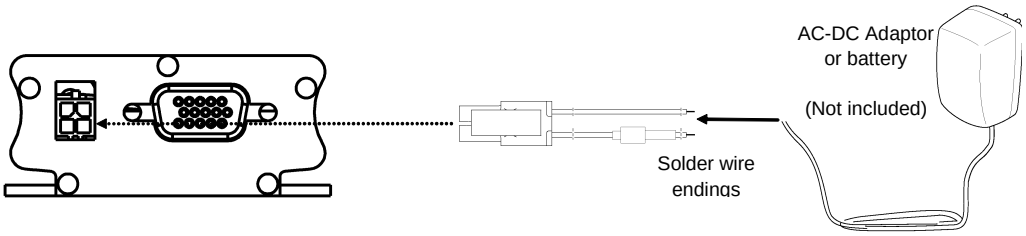
Connection example using optional RS232 cable



3.4 Connect the DC power supply

Connect the open ending of the provided power cord to a DC supply. Refer to the following for power supply requirement:

- Input voltage range : 9-60V DC
- Rated current: 350mA



Plug the molex ending of the power cable to the modem DC connector.

The modem will turn on automatically. The status indicator on the modem will be lit when power on. After a few seconds it will go flashing slowly

Chapter 4

Registration to the Network

4.1 Carrier requirements

Need to supply the Mobile Equipement Identifier (MEID) of the modem to the carrier to set up an account.

4.2 First Time Activation

For **VERIZON** version and **SPRINT** version, provided that an account has been set up, the first time activation is performed automatically when the modem is powered up and registered to the network.

4.3 Provisioning

For **generic** version, the modem must have the right provisioning of the target carrier. Provisioning can be done using software tool WPST[1] through the RS232 port.

Consult the carrier for setting up an account and the steps for automatic activation.

4.4 Ready to use

During the first activation, the Mobile Directory Number (MDN), Mobile Identification Number (MIN) and Preferred Roaming List (PRL) are updated. After that, the modem is ready to register to network and to use the subscribed service.

Refer to the AT commands document for setting up the required service.

[1] Wavecom Product Support Tool can be requested from Maestro Wireless Solutions

Chapter 5

Troubleshooting

5.1 The modem's LED does not light

- Check if the modem has been properly connected to a 9-60V power supply.
- Check if the power connector is properly inserted.
- Check the fuse on the power cord.

5.2 The modem's LED lights but does not blink long time after power up

- Check if the CDMA antenna has the right characteristics & that the antenna is correctly connected to the modem.
- Check if the network coverage is available.
- For GENERIC version, make sure the valid PRL is loaded in the modem and the modem has the right provisioning.
- For VERIZON version and SPRINT version, make sure an account is set up with the carriers and the first activation done.

5.3 The modem does not respond to the terminal program

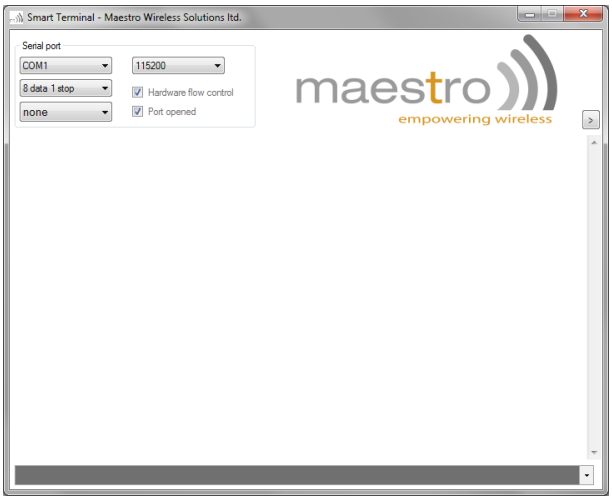
- Check if the RS232 cable has been properly connected.
- Check if your program has proper settings. Factory setting of the modem is:
  - baudrate at 115200 bps
  - 8 data bits
  - no parity bit
  - 1 stop bit

5.4 Debug, or further command using Smart Terminal as example

First, you can find our Hyper Terminal substitute at the following address: `http://www.maestro-wireless.com/software/`

Then follow the steps:

- Open the software, you can find the shortcut on your desktop, or access it by the Start menu > All Programs > Maestro Wireless Solutions > Smart Terminal.
- Once open you will have to select the good serial port configuration (By default: COM1, 115200, 8 data 1 stop, none, with hardware flow control)
- Open the port by ticking the Port opened box :



- Then you can type command like “AT” and check the "OK" response from the modem.

5.5 Basic operations

Followings are examples of some AT commands. Please refer to the AT command document for a full description.

Description	AT commands	Modem response	Comments
Network registration checking	AT+CREG?	+CREG: 0,1	Modem registered to the network
Receiving signal strength	AT+CSQ	+CSQ: 20,0	The first parameter has to be at least 15 for normal communication
Check identity of PRL loaded	AT+WPRL?	+WPRL: 65535 +WPRL: 50568 +WPRL: 57003	65535 represents GENERIC version 50568 represents SPRINT version 57003 represents VERIZON version
Check ESN & MEID	AT+CGSN	+CGSN: A10000094119D8, 808FFD36	MEID: A1000094119D8 ESN: 808FFD36

Chapter 6

Specifications

- CDMA 2000 / 1XRTT Dual Band 800 / 1900 MHz
- Band Class 0 (Tx: 824~849MHz Rx: 869~894MHz)
- Band Class 1 (Tx:1850~1910MHz Rx 1930~1990MHz)
- Supports Async Data Service, Circuit Switched Data, Packet Data
- Data rates up to153 kbps forward & reverse
- TCP/IP
- IS-637 Short Message Service (MO & MT)
- GPS One

Power supply requirement:

- Input voltage range : 9-60V DC
- Rated current: 350mA

Typical current consumption:

	@12V
Idle mode	26mA
Communication mode @23dBm RF power	180mA

Interfaces:

- Status Indicator
- CDMA antenna SMA female connector
- GPS antenna SMA female connector
- 15 pin sub-D connector
- 4 pin power supply connector

Dimensions:

- Overall size: 88mm x 60mm x 26mm
- Weight: 100g

Temperature range:

- Operating: -30℃ to +70℃
- Storage: -40℃ to +80℃